

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re PATENT APPLICATION of :

Ken Ogura :

Serial No.: [NEW] : Attn: Applications Branch

Filed: June 19, 2001 : Attorney Docket No.: OKI.244

For: Conductor Posts, Construction for and Method of Fabricating Semiconductor
Integrated Circuit Chips Using the Conductor Post, and Method of Probing
Semiconductor Integrated Circuit Chips

PRELIMINARY AMENDMENT

Honorable Assistant Commissioner for Patents and Trademarks,
Washington, D.C. 20231

Sir:

Prior to the examination of the above-identified application, the following
amendments and remarks are submitted:

In the Specification¹

*Kindly replace the "BRIEF DESCRIPTION OF THE DRAWINGS" section
extending from line 6, page 5, to line 27, page 6, with the following:*

¹ A marked-up copy of the original specification showing additions and deletions thereto is attached.

BRIEF DESCRIPTION OF DRAWINGS

FIGS. 1A-1K are views for explaining fabricating steps according to a first embodiment of the invention;

FIGS. 2A-2B are view for explaining a case where a semiconductor IC board fabricated according to the first embodiment of the invention is connected to an external printed board;

FIGS. 3A-3B are views for explaining a case where the semiconductor IC board fabricated according to the first embodiment of the invention is filled with an insulating material;

FIG. 4 is a view for explaining a case where a guide mark is attached to the semiconductor IC board fabricated according to the first embodiment of the invention;

FIGS. 5A-5B are views for explaining side views in FIG. 8;

FIGS. 6A-6C are views for explaining a case where heights of metal posts which are fabricated according to the first embodiment of the invention are varied;

FIGS. 7A-7K and 8A-8D are views for explaining fabricating steps according to a second embodiment of the invention;

FIGS. 9A-9I are views for explaining fabricating steps according to a third embodiment of the invention;

FIGS. 10 and 11 are views for explaining fabricating steps according to a fourth embodiment of the invention;

FIGS. 12A-12C, 13A-13C, 14A-14B and 15A-15C are views for explaining fabricating steps according to a fifth embodiment of the invention;

FIGS. 16A-16E and 17A-17B are views for explaining fabricating steps according to a sixth embodiment of the invention;

FIGS. 18A-18H are views for explaining fabricating steps according to a seventh embodiment of the invention;

FIGS. 19A-19D are views for explaining fabricating steps according to an eighth embodiment of the invention;

FIGS. 20A-20D are views for explaining fabricating steps according to a ninth embodiment of the invention;

FIGS. 21A-21C and 22A-22D are views for explaining fabricating steps according to a tenth embodiment of the invention;

FIGS. 23A-23D are views for explaining fabricating steps according to an eleventh embodiment of the invention;

FIGS. 24A-24G are views for explaining fabricating steps according to an eleventh embodiment of the invention;

FIGS. 25A-25C are views for explaining the construction according to a thirteenth embodiment of the invention;

FIGS. 26A-26B and 27A-27I are views for explaining procedures to probe and measure the semiconductor IC board fabricated according to the embodiments of the invention;

FIGS. 28A-28B are views for explaining steps of fabricating a probe electrode in a probing apparatus for use in the probing and measurement; and

FIGS. 29A-29E are views for explaining prior arts.

REMARKS

By this Amendment, the "Brief Description Of Drawings" section of the specification has been revised to correct an error (the description of Figs. 28 and 29 were duplicates) and to properly identify the sub-figures throughout the drawings.

Entry of this Preliminary Amendment is respectfully requested.

Respectfully submitted,

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irregularities, or concave or convex. As a result, when the tip end of the metal post is dipped in, for example, a solder bath or a plating bath, molten solder or plating liquid enters concaves of the irregularities, and hence surface tension occurs to solder or plating liquid therearound. Accordingly, the solder bump can be easily formed at the tip end of the metal post.

BRIEF DESCRIPTION OF DRAWINGS

FIGS. 1A-1K are

~~FIG. 1 is~~ views for explaining fabricating steps according to a first embodiment of the invention;

FIGS. 2A-2B are

~~FIG. 2 is~~ views for explaining a case where a semiconductor IC board fabricated according to the first embodiment of the invention is connected to an external printed board;

FIGS. 3A-3B are

~~FIG. 3 is~~ views for explaining a case where the semiconductor IC board fabricated according to the first embodiment of the invention is filled with an insulating material;

FIG. 4 is a view for explaining a case where a guide mark is attached to the semiconductor IC board fabricated according to the first embodiment of the invention;

FIGS. 5A-5B are

~~FIG. 5 is~~ views for explaining side views in FIG. 8;

FIGS. 6A-6C are

~~FIG. 6 is~~ views for explaining a case where heights of metal posts which are fabricated according to the first embodiment of the invention are varied;

FIGS. 7A-7K and 8A-8D

~~FIGS. 7 and 8~~ are views for explaining fabricating steps according to a second embodiment of the invention;

FIGS. 9A-9I are

~~FIG. 9 is~~ views for explaining fabricating steps according to a third embodiment of the invention;

FIGs. 10 and 11 are views for explaining fabricating steps according

to a fourth embodiment of the invention;

FIGS. 12A-12C, 13A-13C, 14A-14B and 15A-15C

~~FIGS. 12 to 15~~ are views for explaining fabricating steps according to

a fifth embodiment of the invention;

FIGS. 16A-16E and 17A-17B

~~FIGS. 16 and 17~~ are views for explaining fabricating steps according

5 to a sixth embodiment of the invention;

FIGS. 18A-18H are

~~FIG. 18 is~~ views for explaining fabricating steps according to a

seventh embodiment of the invention;

FIGS. 19A-19D are

~~FIG. 19 is~~ views for explaining fabricating steps according to an

eighth embodiment of the invention;

FIGS. 20A-20D are

10 ~~FIG. 20 is~~ views for explaining fabricating steps according to a ninth

embodiment of the invention;

FIGS. 21A-21C and 22A-22D

~~FIGS. 21 and 22~~ are views for explaining fabricating steps according

to a tenth embodiment of the invention;

FIGS. 23A-23D are

~~FIG. 23 is~~ views for explaining fabricating steps according to an

15 eleventh embodiment of the invention;

FIGS. 24A-24G are

~~FIG. 24 is~~ views for explaining fabricating steps according to a

twelfth embodiment of the invention;

FIGS. 25A-25C are

~~FIG. 25 is~~ views for explaining the construction according to a

thirteenth embodiment of the invention;

FIGS. 26A-26B and 27A-27I

20 ~~FIGS. 26 and 27~~ are views for explaining procedures to probe and

measure the semiconductor IC board fabricated according to the

embodiments of the invention;

FIGS. 28A-28B are

~~FIG. 28 is~~ views for explaining steps of fabricating a probe electrode

in a probing apparatus for use in the probing and measurement; and

25 ~~FIG. 29 is views for explaining steps of fabricating a probe electrode~~

~~in a probing device for use in the probing and measurement; and~~

FIGS. 29A-29E are

~~FIG. 30 is~~ views for explaining prior arts.